REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. Interview with Examiner

The applicant is grateful that the examiner entertained an interview with the applicant's representative on April 5, 2005. At the interview, the current amendment of claim 15 was presented, and discussed in view of U.S. Patents 5,838,805 (Warnaka et al.) and 4,439,640 (Takaya).

It was pointed out that the Warnaka et al. patent fails to explicitly or implicitly disclose or suggest the transducer of claim 15 having a membrane that is not round and lacks symmetry over 360° in relation to the shape of the piezoelectric element.

In response to the proposed amendment of claim 15, the examiner suggested filing a declaration executed by the inventor that is directed to the advantages of a transducer having the shape relationship that is currently recited in claim 15. As will be discussed below, the applicant submits herewith the very declaration suggested by the examiner during the interview pointing to the advantages of the transducer according to claim 15.

2. Priority Under 35 U.S.C. § 119

It will be pointed out that the outstanding Office Action does not provide acknowledgment of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). According to the records of the applicant, the filing receipt of the pending application indicates that the pending application claims priority of Belgian application 2002/0601 filed October 21, 2002 .

The applicant respectfully requests the examiner to acknowledge the claim for priority and receipt of the foreign priority document submitted under 35

U.S.C. § 119 with the original application papers. If the document has been lost, a new document will be provided.

3. In the Claims

Claim 15 is the only pending claim that is currently amended. Specifically, claim 15 is amended to recite that the membrane is not round and lacks symmetry over 360° in relation to the shape of the piezoelectric element. Support for this rejection is provided in the specification on page 7, lines 24-30.

Entry of this amendment is respectfully requested in the next Office communication.

4. Rejection of claims 15-17 and 30 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 4,439,640 (Takaya) in view of U.S. patent (Warnaka et al.)

This rejection is respectfully traversed on the basis that the combination of the Takaya and Warnaka et al. patents fails to disclose or suggest the transducer according to claim 15. Therefore, claim 15 is patentable over the combination of the Takaya and Warnaka et al. patents. Claims 16, 17 and 30, which depend from claim 15, are at least patentable based on their dependency from claim 15, and their individually recited features.

As discussed during the interview, it was pointed out that the Takaya and Warnaka et al. patents do not disclose or suggest a transducer having a membrane that is not round and lacks symmetry over 360° in relation to the shape of the piezoelectric element. While it is true that the Warnaka et al. patent does indeed describe piezoelectric elements that have a variety of shapes, there is no disclosure or suggestion as to the corresponding shape of the substrate. In fact, this reference is silent on the shape of the substrate relative to the piezoelectric element.

It will be pointed out that in each embodiment in the Warnaka et al. patent, the substrate generally has the same shape as the piezoelectric element. Hence, one cannot ascertain from the Warnaka et al. patent the specific relationship between the piezoelectric element and the substrate. Moreover, the Warnaka et al. patent describes certain embodiments which would tend to teach away from providing a substrate having a relationship with the piezoelectric element in the manner of claim 15.

Specifically, in the embodiment of Fig. 3 of the Warnaka et al. patent, the piezoelectric element is partially or wholly surrounded by a plurality of motion couplers 25, 26, 27,28. The motion couplers limit the minimum thickness of the piezoelectric element and require a more complex manufacturing method compared to glueing of a piezoelectric element onto a multi layer membrane as described by the pending application. Thus, this embodiment requires that the piezoelectric element and the substrate have essentially the same shape.

Turning to the substrate according to the embodiment of Fig. 4 of the Warnaka et al. patent, this substrate is limited to two layers: one layer comprising a substrate of steel, aluminum, or brass, and a second layer comprising a motion coupler such as brass. On the contrary, the membrane according to the present invention is a multi layer membrane wherein one layer is a polymer layer. The Warnaka et al. patent fails to disclose or suggest this fundamental feature of the membrane according to the pending application and hence cannot be considered to possess the superior harmonic distortion results obtained from the transducer of claim 15.

In view of these observations, it is submitted that even if the Warnaka et al. patent is combined with the Takaya patent, the combination of these patents falls short in teaching the specific shape relationship between the piezoelectric element and substrate according to pending claim 15.

As noted above, submitted herewith is a sworn declaration by the applicant who exemplifies the advantages of the transducer according to claim 15 of the pending application over known systems. Specifically, the declaration points out, through experimental data, that the transducer of the present invention has a smoother frequency response curve, and less harmonic distortion than in transducers not having the shape relationship recited in claim 15.

The examiner is invited to consider the experimental information provided in the declaration, and understand that the recited shape relationship between the piezoelectric element and the membrane is not trivial but indeed provides unexpected results and significant advantages over known transducers. Therefore, this relationship is novel and non-obvious.

In view of these observations, and the declaration, it is kindly submitted that the transducer of claim 15 of the pending application is not disclosed, suggested or taught by the Takaya and Warnaka et al. patents, whether considered collectively or individually.

Therefore, withdrawal of this rejection is respectfully requested.

5. Remaining prior art rejections

The remaining rejections of the claims are premised on the combination of the Takaya and Warnaka et al. patents. Since it is shown that neither the Takaya patent nor the Warnaka et al. patent disclose or suggest each and every limitation of claim 15, it is submitted that the secondary prior art references considered in combination with the Takaya and Warnaka et al. patents do not make up for the shortcomings of this combination.

As a result, withdrawal of the rejection of the pending claims is requested in view of the combination of the Takaya and Warnaka et al. patents taken in consideration with the secondary references cited in the Action.

6. Conclusion

In view of the amendments of claim 15, the foregoing remarks, and the inventor's declaration, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that claims 15-30 be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

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Respectfully submitted,

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